

## ABSTRACT

A method increases the spatial resolution of a source image based on an auxiliary, co-registered image of a higher spatial resolution. Each of the source and auxiliary images includes a plurality of pixels with corresponding spectral intensities and the method includes reducing, identifying, deriving, subdividing and modifying steps. Multiple auxiliary images can be used with the method.

In the reducing step, a spatial resolution of the auxiliary image is reduced to a common resolution with the source image. Then in the identifying step, corresponding groups of pixels at the common resolution in the source and auxiliary images are identified. Then in the deriving step, a mapping function is derived which relates the rate of change of intensity of each group in the auxiliary image and the corresponding rate of change of intensity in the corresponding group in the source image to the intensity vector. This map can be conditioned on any number of auxiliary image planes.

In the subdividing step, each source pixel is subdivided. Then in the modifying step, the spectral intensity of each subdivided source pixel is modifying based on the map and the local intensity variations of the auxiliary image. This results in increasing the resolution of the source image.

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